



Sustainable
Manufacturing and
Environmental
Pollution
Programme

SHARED RESPONSIBILITY IN PLASTICS END-OF-LIFE SYSTEMS

What the SMEP Programme
reveals about the hidden costs of
recovery, credibility and transition

SYNTHESIS REPORT



September 2026



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For five years, the Sustainable Manufacturing and Environmental Pollution (SMEP) Programme has worked to address pollution from key manufacturing sectors in sub-Saharan Africa and South Asia, targeting pollution where it originates, inside factories, tanneries and recycling plants, by funding practical pilot technologies, building local capacity and generating evidence for policy.

The SMEP Programme is funded by UK International Development and implemented by the UK Foreign, Commonwealth and Development Office (FCDO) in partnership with UN Trade and Development (UNCTAD). Programme management is delivered by Pegasys International and SouthSouthNorth (SSN).

This report was produced by Zoë Lenkiewicz, Director, Global Waste Lab, on behalf of the SMEP Programme. Support was provided by Alexa von Geusau, Amanda Dinan and Staci Warrington from SSN, and Henrique Pacini and Glen Wilson from UNCTAD.

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Disclaimer

Views expressed in this synthesis report are those of the authors and do not necessarily reflect those of their institutions or their members. This report has not been formally edited.

This synthesis report brings together learning from the Sustainable Manufacturing and Environmental Pollution (SMEP) Programme's plastics end-of-life knowledge capture series. It draws on three moderated webinars and three accompanying briefing notes, as well as wider SMEP Programme learning, especially the Flipflop Project's work on plastics recovery, policy engagement and regional action in East Africa, led by Dipesh Pabari, and the Plastic-to-Ghar project in Nepal, led by Curie Park.

The SMEP Programme Plastics Webinar Series created space for supported projects, regulators, standards experts, policy specialists and practitioners to examine what helps plastics end-of-life solutions move from promising interventions to functioning systems. Solutions to plastic pollution are often framed around individual actions: collect more material, improve recycling, build traceability systems, introduce standards, promote substitutes or regulate problematic products. Each intervention has value, but the SMEP Programme's experience shows that these interventions only work when the surrounding system is designed to support them.

Across the plastics end-of-life knowledge capture series, five findings emerged, revealing a consistent pattern. Together, they show that plastics end-of-life systems depend not only on enterprise effort or technical solutions, but on how costs, responsibilities, data, standards, markets and policy frameworks are organised across the wider system.

The actors doing the practical work often carry costs, risks and coordination gaps that sit beyond their control. Recovery enterprises pay for clean-up, sorting, washing and safe disposal of material that cannot be recycled. Traceability systems create credibility that is valuable across the wider system, but the cost of building and maintaining them is not always shared. Projects developing alternatives to single-use plastics often find that the policies, incentives and markets needed to bring those alternatives to scale are not yet in place.

The analysis presented here examines how costs, responsibilities and benefits are distributed across plastics recovery, traceability and substitution systems, and how those patterns determine whether solutions can become viable, credible and scalable. It considers what future programmes, funders and policymakers can do to address these underlying system constraints, rather than treating interventions in isolation.



↑ Image 1.
Heritage furniture made from recycled plastic collected in the Lamu Archipelago, Kenya, by the SMEP-supported Flipflop Project.

© FlipFlop (2026).



← Image 2.
Community-led cash-on-collection at the project's material recovery facility.

© FlipFlop (2026).



← **Image 3.**
Elderly woman in Ree village, Nepal, where the SMEP-supported Plastic-to-Ghar project works to reduce plastic pollution and improve local livelihoods.

© H. Pacini, UNCTAD (2024).

↓ **Image 4.**
Recycled plastic repair sheets produced by Paramendo, a local initiative incubated by Plastic-to-Ghar.

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THE SMEP PROGRAMME PLASTICS WEBINAR SERIES

The SMEP Programme organised **three moderated webinars** in **May 2026** as part of its plastics end-of-life knowledge capture series. Each webinar explored a different pathway for plastics end-of-life action: recovery viability, traceability and material transition.

The series reached more than **230 registered participants** from **50 countries**. Registrations were strongest from Africa, with significant participation from Europe and Asia, and included private sector actors, community and non-profit organisations, academics, public sector agencies and international organisations. Around two-thirds of registration responses selected all three sessions, suggesting strong interest in the series as a connected learning journey across recovery, traceability and material transition.

Session 1 | *Making plastics recovery models viable*, held on 7 May 2026, featured two SMEP-supported projects in Kenya and Ghana, with contributions from **Christian Mang'eli** (Mr Green Africa), **John Adelegan** (RiverRecycle) and **David Ong'are** (National Environmental Management Authority, Kenya).

Session 2 | *Traceability, standards and regulatory alignment*, held on 13 May 2026, brought together projects and perspectives from Nigeria, Ghana and Kenya, with contributions from **Victor Boyle-Komolafe** (GIVO Africa), **Judith Osei-Kumi** (Environmental Protection Agency, Ghana) and **Marxine Waite** (Environmental Coalition on Standards).

Session 3 | *Substitutes, compostability and regional pathways*, held on 20 May 2026, examined plastic substitutes and regional policy harmonisation, with contributions from **Ebenezer Laryea** (FreshPPact), **Faith Macharia-Okaalo** and **Carlotta Dal Lago** (Africa Legal Network), and **Henrique Pacini** (UNCTAD).

The series was convened and moderated by **Zoë Lenkiewicz** of Global Waste Lab. Programme coordination was provided by **Amanda Dinan**, **Alexa May von Geusau** and **Staci Warrington** of SouthSouthNorth, and **Henrique Pacini** and **Glen Wilson** of UNCTAD.

BRIEFING NOTE 1

MAKING PLASTICS RECOVERY MODELS VIABLE

Plastics recovery enterprises can succeed by turning waste into marketable materials, but only when producers, governments, and municipalities take responsibility for their share of the costs.



“ Viability is not driven by collection alone. It is driven by the ability to consistently produce market-acceptable material. ”



Christian Mang'eli
Mr. Green Africa



Victor Boyle-Komolafe
GIVO Africa

“ The data that is generated from the operations is more important than the material itself. ”



BRIEFING NOTE 2

BUILDING CREDIBLE PLASTICS RECOVERY SYSTEMS

Credible plastics recovery systems are built by linking useful data to standards, regulation, markets and finance. Traceability facilitates the verification, trust, and scaling of recovery systems.



BRIEFING NOTE 3

PLASTIC SUBSTITUTES, STANDARDS AND REGIONAL POLICY PATHWAYS

Substitution reduces pollution only when alternatives are tested in real conditions, supported by standards and end-of-life systems, and backed by coordinated policies that align regional action with local contexts.



“ We need to fund the systems around substitution, not just the substitute themselves. ”



Faith Macharia-Okaalo
Africa Legal Network

Finding 1

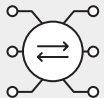
System costs are being absorbed by those closest to implementation

Across recovery, traceability and substitution, the actors doing the practical work often bear costs generated or made necessary by the wider system. These are not simply enterprise or project costs. They are system costs that have not been clearly allocated.

This pattern was visible across the three briefing notes. Recovery enterprises carry the costs of cleaning, sorting, washing and safe disposal of material that cannot be recycled. Traceability system builders invest in data infrastructure and verification that create value for producers, regulators, buyers and investors. Substitution projects absorb the early costs of research, testing, certification and market development before the wider policy and market conditions are in place.



Table 1. How system costs are carried across plastics recovery, traceability and substitution

Where costs currently fall		Costs and burdens absorbed
	Recovery enterprises	Clean-up, sorting, washing, handling of contaminated material, wastewater treatment and safe disposal of material that cannot be recycled.
	Traceability system builders	Data infrastructure, digital tools, verification, reporting and maintenance.
	Substitution projects and innovators	Research and development, testing, certification, market development and early production costs.
	Informal workers and small operators	Sorting, aggregation, compliance pressures, income volatility and health and safety risks, including exposure to contaminated materials.

Benefits to the wider system

- Cleaner communities, reduced leakage, recovered materials, public environmental benefits and reduced pressure on municipal systems.
- Credible claims, stronger accountability, market confidence, extended producer responsibility (EPR) implementation, investor confidence and brand reporting.
- Reduced reliance on problematic plastics, safer alternatives, new markets and public environmental benefits.
- Material recovery, local livelihoods, reduced leakage, recycling markets and support for gaps in municipal services.

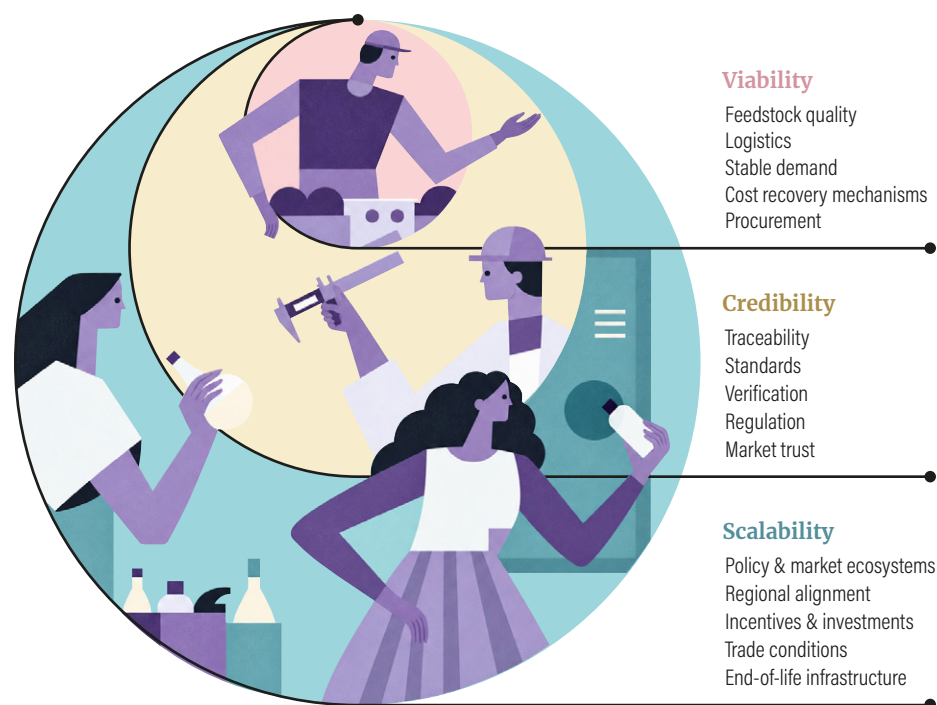
↑ Image 5.
Mr. Green Africa's plastics processing facility in Nairobi, Kenya, converting collected plastic into high-quality post-consumer recyclates.
© H. Pacini, UNCTAD (2024).

Finding 2

Technically proven models still need enabling conditions to scale

Plastic solutions do not scale simply because a pilot works. A recovery model may be technically viable, but it still needs stable feedstock, reliable markets, working logistics and routes for material that cannot be recycled. A traceability system may generate useful data, but it needs standards, regulation and market demand for that data to be recognised and rewarded. A substitute may perform well in testing, but it needs certification, policy support, investment, market access and demand at sufficient scale to move beyond the pilot stage.

Figure 1. Viability, credibility and scalability: enabling conditions for plastics recovery models



Note: Each layer depends on wider enabling conditions, including roles and responsibilities for enterprises, producers, regulators, public agencies and investors.



← Image 6. Agricultural mulch film in Ghana, where the SMEP-supported FreshPPact project developed alternatives to conventional plastic mulch.

© Beanstalk Media, Blueskies (2026).

The SMEP Programme's experience shows this pattern across recovery, traceability and substitution. Mr Green Africa's progression towards food-grade PET recycling required not only investment in washing technology, but access to credible standards, export market relationships and regulatory recognition. GIVO Africa's experience shows how traceability data can create value beyond the sale of plastic itself, supporting ESG reporting, investor confidence and EPR implementation. But that value is not automatically recognised or rewarded. Without regulation or market structures that incentivise data collection, most operators have little reason to invest in it. FreshPPact developed alternatives to plastic mulch film used in agriculture, and in doing so identified a critical gap: the policy ecosystem needed to bring those alternatives to scale was missing. Developing a policy blueprint for the public sector became part of the project itself.

Programme flexibility is also an enabling condition. Several of the most useful SMEP Programme lessons came from projects adapting their models as they learned more about feedstock quality, market demand, standards, policy gaps or implementation constraints. This matters because plastics systems are complex: markets shift, policies change, and early assumptions may not hold. Programmes need enough flexibility to support learning and adaptation, not only delivery against fixed initial plans.

Finding 3

Plastics systems are still operating in silos

The challenge in plastics end-of-life systems is rarely that a single component is missing. More often, the components that do exist are designed, funded and implemented separately, rather than as parts of a connected system.

The misallocation of costs identified in [Finding 1](#) helps explain why plastics end-of-life systems are often designed and funded in silos. When the full system cost is not visible, recovery, traceability, standards, EPR, substitution and regulation are more likely to be treated as separate workstreams rather than connected parts of one system.

Recovery enterprises are not always connected to municipal collection and disposal systems, even though feedstock quality and disposal costs depend directly on those systems. Traceability, standards, EPR and regulation are often developed as separate policy tools, even though each depends on the others to function: standards without regulation remain voluntary, regulation without traceability is hard to enforce, and EPR without functioning data systems cannot direct funding to where costs fall.

Substitution policies can also be disconnected from the waste management infrastructure, composting capacity and recycling systems needed to handle alternatives after use. Innovation pilots can sit apart from procurement pathways, trade conditions, finance systems and the regulatory environment needed to take them to scale.

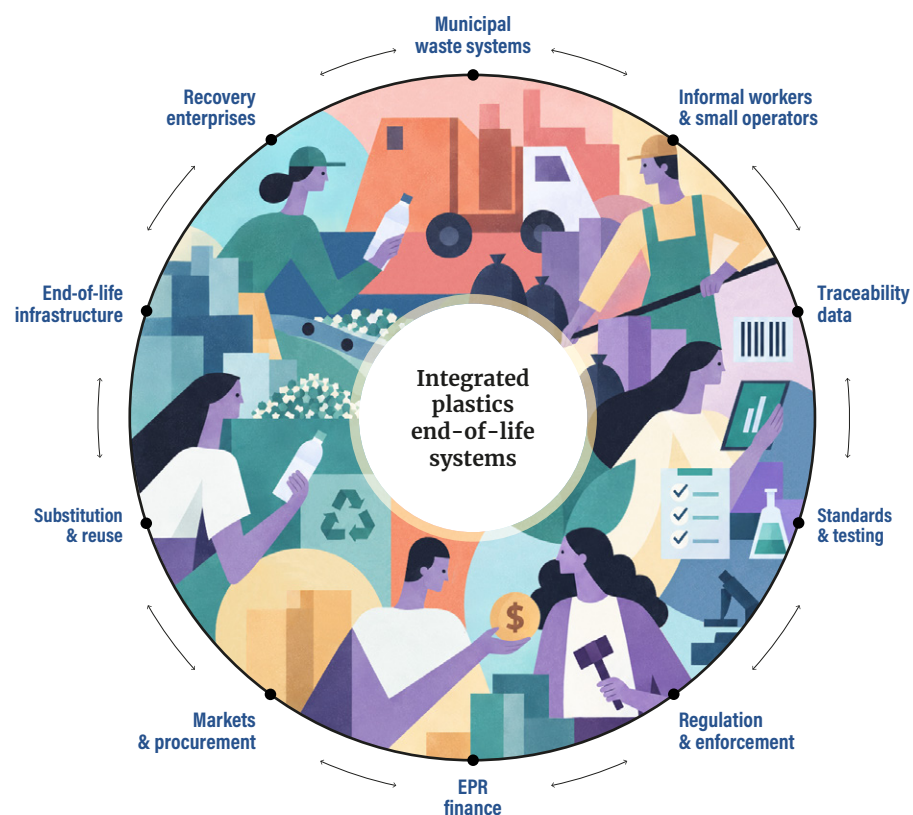
Silos are generally reinforced by how programmes are funded, regulated and institutionally mandated. Carlotta Dal Lago of Africa Legal Network emphasised the need to break silos, connect projects into a more holistic strategy and avoid funding similar activities repeatedly without an overarching government or programme-level direction. Better integration requires not only stronger project design, but a clearer view of how recovery, traceability, standards, regulation, finance and markets connect.

[Figure 2](#) illustrates this problem: plastics end-of-life systems depend on multiple connected functions, but these are too often designed and funded as separate workstreams.



← [Image 7.](#)
Processed post-consumer plastic at the SMEP-supported Mr. Green Africa recycling facility in Nairobi, Kenya.
© H. Pacini, UNCTAD (2024).

[Figure 2.](#) Plastics end-of-life systems depend on connected functions, not parallel workstreams



Finding 4

Regional coordination is needed for scale

National policy can change the conditions for plastics recovery, traceability and substitution within a single market. Kenya's 30 per cent recycled content mandate for plastics manufacturers creates domestic demand for recovered material, while Ghana's emerging EPR framework and e-registry are connecting standards, reporting and producer responsibility into a more coherent national system. These examples show how national policy can begin to shift incentives, create demand and organise responsibility.

Table 2. Regional coordination helps national action translate into larger, more stable markets

National action can ...	Regional coordination can ...
Set bans or controls on problematic plastics	Align definitions, exemptions and transition timelines, avoid cross-border leakage
Establish EPR frameworks	Reduce fragmented obligations for producers across markets
Create recycled content requirements	Build larger and more predictable demand for recycled materials
Develop standards and testing requirements	Support mutual recognition and reduce confusion
Support substitute innovation	Improve trade access and help alternatives reach scale
Build registries and data systems	Improve comparability, verification and regional learning

Several constraints identified across the webinar series are regional or global in nature. Plastic products, packaging, recycled materials and substitutes are traded internationally. Standards, data requirements and verification systems can differ between neighbouring markets. Products that are restricted in one country can continue to move through another. Enterprises operating across borders may face different compliance requirements, while substitutes and recycled materials may struggle to reach the scale needed to compete with conventional plastics.

UNCTAD's work shows that non-plastic substitutes, including natural fibres and ceramics, can face higher import tariffs than conventional plastics in many markets, making greener alternatives less competitive in trade than the products they are designed to replace. Data and verification requirements can also vary by jurisdiction, creating friction and adding costs for enterprises operating across multiple markets.

Regional coordination provides a way to address these cross-border problems. It can align definitions, standards, transition timelines, EPR obligations and enforcement approaches across connected markets. It can also help build larger and more predictable markets for recycled materials and credible alternatives.

The East African Community Single-Use Plastics Bill shows what this can look like in practice. Developed with support from Africa Legal Network (Kenya) and the Flipflop Project, the bill attempts to move beyond fragmented national bans towards a shared regional architecture covering definitions, standards, transition periods, EPR obligations and enforcement. Faith Macharia-Okaalo of Africa Legal Network was clear that the hardest question is no longer whether regional coordination is necessary, but how to sequence implementation across partner states that are starting from different legal, economic and infrastructural positions.

UNCTAD's work on sectoral substitution pathways and regional plastics governance points in the same direction. Regional coordination is not only about harmonising bans. It is also about building markets, reducing trade barriers, aligning standards, creating the scale needed for alternatives and recycled materials to compete, and showing how regional implementation can support the Global Plastics Treaty process.

Finding 5

Uneven cost and benefit distribution weakens accountability

The benefits of plastics recovery, traceability and substitution are widely shared, but the responsibility for making those benefits possible is not always clearly assigned. Cleaner communities, credible recycled-content claims, stronger markets and reduced pollution create value for producers, regulators, investors, consumers and the environment. But unless the costs behind those outcomes are visible and allocated, they remain concentrated close to implementation.

This helps explain why the same cost patterns persist. Producers and brands may benefit from recovered materials, credible claims or improved public trust without directly funding the full cost of collection, sorting, data, verification or safe disposal. Regulators may benefit from better information and compliance systems, but without clear funding routes those systems are difficult to maintain. Communities and municipalities may benefit from cleaner environments, but may still be left managing waste when markets fail or enterprises cannot absorb the cost.

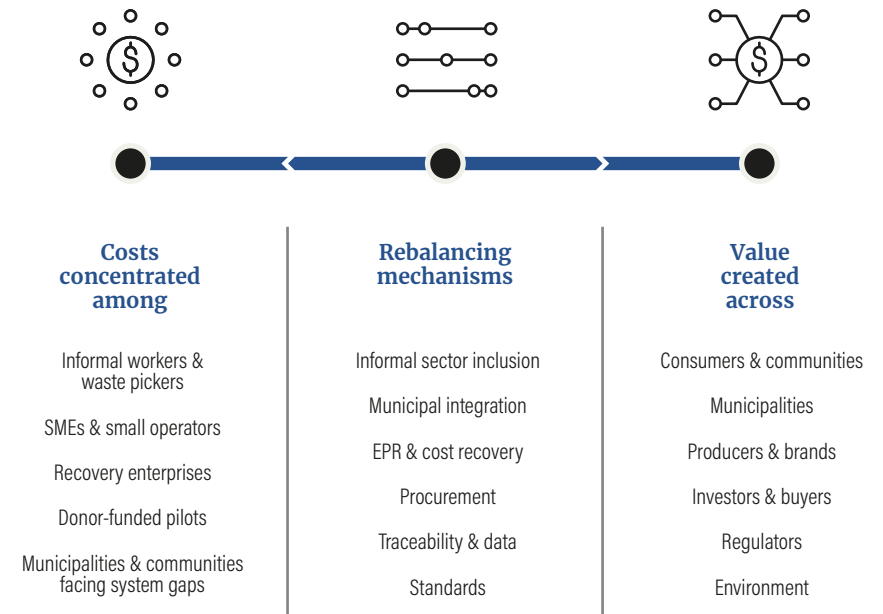
Informal workers and small operators are particularly exposed. Across the webinars, speakers agreed that informal workers and small operators are central to collection, sorting, aggregation and recycling. Yet they are often least able to absorb new compliance costs, invest in traceability systems, meet standards or withstand market shocks. They may also face occupational health and safety risks, including exposure to contaminated or hazardous materials. If EPR, standards and substitution policies are not designed with them in mind, the risk is that costs are shifted downward while benefits flow upward.

Extended producer responsibility was the mechanism most consistently identified across the three webinars for rebalancing these costs. Without careful design, however, EPR risks adding a layer of administration while leaving the underlying cost distribution unchanged. The key is transparency: EPR funding needs to be visible, accountable and reinvested where costs are carried, including collection, sorting, the safe disposal of material that cannot be recycled, informal worker inclusion, data systems, market development and smaller regions or municipalities that may otherwise be left with funding gaps.



← Image 8. Plastics and organic waste sorting at SMEP-supported TakaTaka Solutions in Nairobi, Kenya.
© H. Pacini, UNCTAD (2024).

Figure 3. Rebalancing costs and value in plastics end-of-life systems



Implications for future programme design

The five findings point towards a set of practical implications for how future programmes, funders and policymakers approach plastics end-of-life systems.

1. Map costs, benefits and responsibilities before scaling up

Projects should identify the full cost of recovery, traceability, standards, substitution, safe disposal and enforcement before assuming a model is viable. Identify who carries those costs, who benefits from the activity, who has the power to change the conditions, and what mechanism will rebalance responsibility. Without this mapping, programmes risk funding visible outputs while leaving the underlying cost distribution unchanged.

2. Fund enabling conditions, not only visible outputs

Tonnes collected, pilots launched and products developed are outputs, not systems. Support the infrastructure that allows solutions to work: source separation, data systems, testing capacity, standards development, procurement pathways, market development, safe disposal and enforcement capacity. These conditions are often less visible in project budgets, but they determine whether solutions survive beyond the grant period.

3. Integrate recovery, traceability, standards and regulation

Recovery, traceability, standards, regulation and EPR should be designed as connected parts of one system from the outset. Align funding decisions, programme structures and policy workstreams with those connections, rather than treating each element as a standalone intervention. Traceability and standards can also support safer material flows by helping to identify material composition, additives and chemicals of concern where these affect recycling, reuse, substitution or end-of-life management.

4. Use regional alignment and trade as scale strategies

Where material value chains, trade flows and markets cross borders, support harmonised definitions, standards, transition pathways and trade conditions. Use regional coordination to reduce compliance burdens for enterprises, create larger and more predictable markets for recycled materials and alternatives, and reduce the fragmentation that allows problematic products to move from stricter to weaker regulatory environments.

5. Make EPR practical, transparent and accountable

Extended producer responsibility is the mechanism most consistently identified for rebalancing costs across plastics systems, but its design determines whether it works. Make EPR funding visible, accountable and directed to where costs fall, including collection, sorting, safe disposal of material that cannot be recycled, informal worker inclusion, traceability systems and market development. Embed traceability in EPR frameworks so that funding can be directed to the actors and activities doing the work.

6. Build flexibility into grant and programme design

Plastics systems are complex, and early assumptions about markets, feedstock quality, standards, policy readiness or local operating conditions may not hold. Design funding frameworks that allow projects to adapt as they learn, rather than locking them into fixed delivery pathways too early. This helps programmes capture valuable learning while supporting delivery against planned outputs.

Conclusion

The SMEP Programme's experience shows that the gap between ambition and impact is rarely about a lack of enterprise innovation or effort. More often, systems remain fragile because costs are misallocated, enabling conditions are missing, institutions operate in silos, regional markets are fragmented and those who benefit are not always those who pay.

Future programmes need to design for the full system, including finance, standards, traceability, regulation, markets and livelihoods, and build in enough flexibility for projects to adapt as they learn. The core lesson from the SMEP plastics end-of-life learning series is that plastics systems will not become viable, credible or scalable until the costs, responsibilities and enabling conditions needed to make them work are recognised and shared more clearly.



↑ **Image 9.**
The MAPS Exhibition at the 5th United Nations Ocean Forum connected material innovation and policy dialogue. Geneva, Switzerland, March 2025.

© C. von Limburg, UNCTAD (2025).



← **Image 10.**
The SMEP-supported Flipflop Project's recycled-plastic boat, part of its work on plastics recovery, policy engagement and regional action in East Africa.

© S. Foote, FlipFlop (2026).

Annex

The SMEP Programme Plastics Webinar

The registration profile shows that the series reached a broad, cross-regional and cross-sector audience, with **260 registration responses** from **50 countries**. More than half of registrations came from Africa (52.3 per cent), followed by Europe (26.2 per cent) and Asia (15.0 per cent). The highest numbers of registrations came from **Kenya**, the **United Kingdom**, **South Africa**, **Ghana**, **Nigeria**, **India**, **Bangladesh** and **Germany**.

The audience included private sector actors, community and non-profit organisations, academics, public sector agencies and international organisations.

The selection of all **three sessions** by **170 registrants** suggests strong interest in following the series as a connected learning journey across recovery, traceability and substitution. This pattern supports the core argument of the series: plastics end-of-life presents not three separate issues, but a linked systems challenge.

Registration profile

Indicator		Number
Registrants	Session 1: viability	189
	Session 2: traceability	210
	Session 3: material transition	226
	All three sessions	170
Countries represented		50
Unique registered participants		At least 230
Total registration responses		260

Geographic reach

Region	Responses	Share
Africa	136	52.3%
Europe	68	26.2%
Asia	39	15.0%
North America	9	3.5%
Latin America and the Caribbean	4	1.5%
Oceania	4	1.5%
Total	260	100%

Sector profile

Sector	Responses	Share
Private sector • industry • small business	81	31.2%
Community • non-profit organisation	71	27.3%
Other	44	16.9%
Academia	36	13.8%
Public sector • government • agency	27	10.4%
International organisation	1	0.4%
Total	260	100%

Gender profile

Gender	Responses	Share
Male	130	50.0%
Female	126	48.5%
Not specified • other	4	1.5%
Total	260	100%



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